



# Extension FactSheet

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## Sun Exposure: Precautions and Protection

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A golden, bronze tan is often considered a status symbol. Perhaps this supports the idea that people who have time to lie in the sun long enough to develop a deep tan, or who can travel to warm climates during winter, have more money or leisure time than “common folk.” Nevertheless, the goal of many is a deep tan early in spring or to return from vacation with that hearty, healthy glow. Whether a tan suggests status or not, a suntan is a form of skin damage and does not protect you from skin cancer. Ultraviolet rays from the sun will damage skin but can also create vision problems, allergic reactions, depressed immune systems, and skin concerns.

Tanning and burning are caused by ultraviolet rays from the sun. These rays cannot be seen or felt, but penetrate the skin and stimulate cells containing a brownish pigment called melanin. Melanin tries to protect the skin by absorbing and scattering ultraviolet rays. People with dark skins have high amounts of melanin and have greater natural protection from ultraviolet rays. Blondes, redheads, and people with fair skins have less melanin and, therefore, burn more quickly.

As melanin is stimulated by ultraviolet rays, it rises to the skin's surface as a tan. A tan is damage to the skin but may provide some protection against future sun exposure. Individuals with dark skins such as olive, brown, or black are not immune to burning and skin damage caused by careless exposure to the sun. Darker skin does offer more protection than light skin against sunburn and skin cancer.

Three types of ultraviolet rays (UV) from the sun exist: UVA, UVB, and UVC. UVC is deemed as no threat as it is absorbed by the ozone layer. UVB causes burning of the skin or the red associated with sunburn, skin cancer, and premature aging of skin. UVA rays stimulate tanning but are also linked to other problems such as cataracts and other eye problems, premature aging of skin, wrinkling, loss of skin elasticity, skin rashes, and allergic or other reactions to drugs. UVA and UVB

are both designated as causes of skin cancer by the National Institutes of Health.

Skin damage from overexposure to the sun is cumulative over the years and cannot be reversed. Once the damage occurs, it cannot be undone. Most serious and lasting damage occurs before age 18. Protection should start early, particularly with children who enjoy outdoor play on sunny days.

### Potential Sun Exposure

Besides the discomfort of sunburn, other potential problems of excessive exposure to the sun exist. These range from fatal skin cancers to allergic reactions.

### Cancer

Skin cancer has long been associated with exposure to the sun. More than one million cases are diagnosed in the United States annually, with 10,590 being fatal. A definite link between the sun and skin cancer exists. One in five Americans will develop skin cancer during their lifetime. Three types of skin cancer exist: basal, squamous, and melanoma. Basal cancer is identified by pale, waxy skin eruptions or by red, scaly patches. Squamous cancer cells are scaly patches or nodules. Basal and squamous cancer are usually associated with long term exposure to the sun. If identified and treated early, these skin cancers are seldom fatal.

Melanoma accounts for 73% of deaths from skin cancer, is characterized by dark, black or brown patches, and may be confused with a mole. Melanomas often start small, but grow. They are likely to occur in people who experience bad sunburns at infrequent intervals such as on vacations. Should abnormal growth or changes in skin or moles occur, make an appointment with your doctor. All skin cancer is more controllable and less fatal when treated early.

### **Premature Aging of Skin**

Repeated exposure to the sun damages elastin fibers in the skin and accelerates the aging process. Skin loses elasticity, starts to sag and wrinkle, and becomes leathery. The damage is irreversible, with signs beginning to show in the early 20s on fair-skinned individuals. Once even a small amount of damage has occurred, repeated exposure to the sun increases the effect. Besides leathery, wrinkled skin, other signs of damage are brown patches or spots, or skin with a yellow or grayish hue.

### **Sunlight and Allergic Reactions**

Many individuals have sensitivity to sunlight that may be accelerated by certain products, medicines, or drugs. In fact, some medications or products can enhance the effect of radiation from the sun and cause a severe burn or skin eruptions in people who, under other circumstances, may be resistant to severe sunburns.

Some drugs known to increase sensitivity to sunlight include anti-bacterial agents found in medicated soaps and facial preparations, acne treatments, antihistamines, antidepressants, tranquilizers, antibiotics, diuretics, and anti-hypertension drugs. When using any of these products, be especially aware of sun exposure and possible reactions.

As with sensitivity to sunlight, some individuals have natural allergic reactions to sunlight. These may be stimulated by contact with certain plants, perfume, cosmetics, skin or suntan preparations. Usually the result includes skin blemishes that occur following sun exposure. These types of allergic reactions can often be controlled, but not eliminated.

Finally, careless exposure to the sun may be harmful to people with certain diseases. Among these are pulmonary tuberculosis, certain autoimmune diseases, inherited skin diseases, metabolic problems, malnutrition, and alcoholism.

Always be aware of abnormal behavior in individuals who have been in the sun for long periods. This is especially true if they are taking drugs or medications, have fair complexions, or have had little previous or recent exposure to sunlight for long periods.

### **Eye Damage**

Ultraviolet rays also cause eye damage, regardless of skin color. The incidence of cataracts increases with sun exposure. Corneal sunburn and growths on the surface of the eye are thought to be related to long term sun exposure.

Use of UV-blocking sunglasses provides protection from sun damage. Choose sunglasses that block 99% to 100% of UVA and UVB radiation. Be sure to check the label as not all sunglasses provide protection. Labels reading “UV absorption up to 400 nm” or “Meets ANSI UV Requirements” mean the glasses block 99% to 100% UV rays. Color or darkness of lenses does not indicate UV protection, which is an invisible chemical applied to lenses. Note that polarized lenses and mirror-coated lenses don’t necessarily reduce UV absorption unless specifically labeled. All sunglasses offer more protection than no eye wear, but look for statements on UV ratings for best eye care.

## **Potential Sun Exposure: The Burning Quotient**

Most people expect to sunburn on a bright, sunny day. Many factors affect the strength and amount of ultraviolet rays which cause burning to occur. An individual’s physical characteristics and environment affect the amount of sun tanning or burning possible.

### **The Person**

As the amount of melanin in skin increases, so does the natural protection from sunburn. Individuals with dark complexions, especially those with olive, brown, or black skin, can remain in the sun for longer periods before burning occurs. Blondes, redheads, and individuals with fair skin burn readily. In some instances, these people never tan because of the absence or very low levels of melanin in the skin. Therefore, individuals must consider their skin type when selecting sun protection products and planning time in the sun.

Babies under six months of age should be kept out of direct sunlight at all times. Sunscreens should not be used on infants under six months of age. Use hats, clothing, and shading to protect small babies from the sun.

### **Location and Atmospheric Conditions**

The number of ultraviolet rays that reach the skin affect the speed and intensity of tanning or burning. When the atmosphere is thick, fewer ultraviolet rays pass through or reach the skin. At the equator and at higher altitudes, such as the mountains, possible radiation from the sun is greatest because of a clearer and less dense atmosphere to filter out ultraviolet rays. As one moves away from the equator or toward sea level, burning is less intense due to thicker atmospheric conditions. The number of ultraviolet rays at the equator is four times greater than those in Alaska or the southern tip of South America. Also, the southern United States receives one to one and a half times the number of ultraviolet rays as the north.

People who enjoy the sun know that severe burns are likely on hazy, overcast, cloudy-bright days. This effect is called sky radiation. The UVB rays, especially, scatter throughout molecules in the atmosphere and cause burning. Because sunlight seems less intense, less bright, and less warm, individuals normally take fewer precautions and thereby increase the potential for a bad sunburn. Be aware that tanning and burning can occur on hazy days when the sun does not appear to be shining brightly.

Have respect for ultraviolet rays from the sun. They not only create problems on hazy days but also can burn the skin through clothing or while sitting in areas shaded from direct sunlight. Ultraviolet rays bounce off bright surfaces, such as snow, pavement or sand. One can be burned while sitting under a beach umbrella. Sky radiation on hazy days can hit the skin at angles and burn individuals not in direct sunlight.

Ultraviolet rays pass through some fabrics such as open-weave fabrics, lightweight knits, and nylon stockings. T-shirts worn while swimming reduce burning but still allow ultraviolet

rays to pass through. Ultraviolet rays penetrate water but lose half their intensity. Nevertheless, burning can occur on parts of the body submerged in the water.

Most car, home, and office windows block UVB rays but may allow some UVA rays to pass through increasing UV exposure. Tinted windows help block more UVA rays, but that depends on the type of tinting. Although window exposure probably does not pose a great risk most people should avoid extended periods of time close to a window with direct sunlight.

### **Seasonal Conditions**

The amount of ultraviolet radiation available changes with the seasons. In the North Temperate Zone, the maximum radiation possible occurs on June 21. During each season UV rays can cause skin damage depending on length of exposure and skin type.

Be especially careful at midday during warm weather months. Ultraviolet rays are most intense between 10:00 a.m. and 4:00 p.m. The American Academy of Dermatology recommends you wear sunscreen every day if you are going to be in the sun for more than 20 minutes. Plan activities before 8:00 a.m. and after 6:00 p.m. to minimize your exposure to UV rays.

The U.S. Weather Service has developed a daily index of anticipated UV ray intensity. The index is a scale of 0-11+ with the higher the number the greater exposure to UV radiation. The table below explains index values

The index is distributed to weather service field operations and to the media daily. Individuals can access the index on the EPA's web site <http://www.epa.gov/sunwise/whereyoulive.html>

Index Value	Exposure Category
0-2	Minimal
3-4	Low
5-6	Moderate
7-9	High
10+	Very High

When exposed to intense sunlight or radiation from the sun, use extreme care and consider the many factors that may interact and cause skin damage.

Seeking shade is recommended whenever possible especially, when your shadow is shorter than you are. Avoiding intense sunlight protects your skin and reduces your risk of skin cancer.

### **Prevention of Sunburn Damage: Know Which Products Protect**

To prevent sun damage to your skin you need to avoid over-exposure to ultraviolet light. Using sun screen and following some recommended practices will help. Do select products that provide protection. Let's review the various types of sun care products and evaluate those that contain ingredients to filter out

ultraviolet rays (UV radiation) and limit the quantity of rays that can be absorbed by the skin. Some products offer this protection; others do not. What are differences among sun screens, lubricants, and pigment or artificial tanners (sunless tanners)?

### **Sun Screens**

Sun screens contain one or more protective chemicals that absorb and scatter ultraviolet rays. These have a numerical rating system to indicate the specific amount of protection. The numbers, known as Sun Protection Factors (SPF), are listed on the product label. The next section will discuss these in detail.

The higher the SPF number, the greater the protection. Although no sunscreen blocks UV radiation 100 percent. Sun screens are available in many forms including lotions, creams, gels, sprays, ointments and wax sticks. Besides sun screens use a lip balm with SPF of 15 or higher to protect your lips from sunburn.

Sun screens should be applied 20 to 30 minutes before going out into the sun to allow time for the sun screen to start working. Apply liberally and reapply every 2 hours to provide maximum effectiveness. Do not use sunscreens to increase the time spent in intense sunlight or in place of protective clothing.

### **Lubricants**

Suntan preparations often contain a lubricant that reduces the drying effect of the sun on skin. However, suntan lotions, oils, gels, and other moisturizers without extra protection (sun screen), or home preparations, such as mineral oil or baby oil and iodine, only benefit as a lubricant and do not provide protection from the sun's rays.

### **Artificial Tanners (Sunless Tanners) and Stains**

Pigment lotions, artificial tanners, and temporary stains such as bronzes contain chemicals that react with the outer skin layer and color the skin without any protection, unless they also contain a sun screen. The color results have improved in the last few years. The American Academy of Dermatology states that the only safe tan is from the artificial tanning products (sunless tanners). Temporary stains or bronzes are water soluble, and the color is removed by washing with soap and water. Read label information to determine product characteristics and use.

### **Screen Selection: Use the SPF Rating**

Select a sun screen or sun block product according to the SPF rating to achieve optimum protection for your needs. SPF is a numerical rating system to indicate the degree of protection provided by a sun care product. Sunscreen does not give you total protection. When applying sunscreen of SPF correctly your skin gets the equivalent of 1 minute of UVB rays for each 15 minutes you spend in the sun. Thus, 2 hours in the sun wearing SPF 15 sunscreen is the same as spending 8 minutes unprotected. SPF of 15 or greater is recommended to be used year-round by all skin types with those of very fair or fair complexion using an SPF of 30 or more.

## Water Proof and Application

Sun protection is lost through heat, humidity, perspiration, and rubbing off. **Reapply** sunscreen to continue protective benefits. For added protection when exposed to water, as when swimming or water skiing, look for water proof products. Look for labels that read water proof or water resistant. Follow label directions since protection time varies, water proof typically provides protection for at least 80 minutes when swimming or sweating. Where as, water resistant usually only provide protection for 40 minutes. People should reapply after swimming or perspiring heavily.

## Clothing for Sun Protection

Covering up when in the sun is one approach to ultraviolet ray protection. Wearing a long-sleeved shirt and long pants or long skirts will provide optimum protection. Generally, fabrics with a tighter, denser weave, in dark colors, layered, and a matte or dull finish, give the best protection. Unfortunately, these fabrics tend to be hot and less comfortable to wear. Knit constructions, such as cotton t-shirts, give relatively poor protection (SPF rating of 4.8) since UV rays pass through loops on the knit structure.

Several companies are marketing sunlight or UV resistant fabric. These fabrics usually have a tighter weave or knit and are usually darker in color. Many sun-protective fabrics have a label listing the Ultraviolet Protection Factor (UPF) value, which is the level of protection the clothing garment will provide from the sun's UV rays (on a scale from 15 to 50+). The higher the UPF, the more protections from UV rays.

Three categories of UPF protection include:

- 15 to 24 provides “Good UV Protection”
- 25 to 39 provides “Very Good UV Protection”
- 40 to 50 provides “Excellent UV Protection”

A garment labeled “sun-protective” or “UV-protective” has to have at least a UPF of 15. Garments can lose their sun-protective effectiveness if they are too tight or stretched out, damp or wet, and worn and washed frequently.

In Australia children's swimsuits made from sun-protective fabric that cover the child from neck to knees are popular. These are now available in some areas of the United States.

In addition to clothing that covers the skin, remember to wear hats that provide protection. Brims of three inches or wider shade eyes, ears, and neck. Some styles provide loose flaps or drapes to cover ears and neck. Choose styles that allow for air circulation and offer protection as well as comfort. Many fashionable styles are available that are good-looking and functional.

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